

## **REMARKS**

Claims 1-7 were examined and reported in the Office Action. Claims 1-7 are rejected. Claims 1-2 and 4 are amended. New Claims 8-9 are added. Claims 1-9 remain.

Applicants request reconsideration of the application in view of the following remarks.

### **I. In The Drawings**

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the reference sign 18 not mentioned in the description. Applicant has amended the specification to include reference sign 18. Approval is respectfully requested.

### **II. Claim Objections**

Claims 2 and 4 are objected to because of informalities. Applicant has amended claim 2 to overcome the informal objection.

Accordingly, withdrawal of the informal claim objection for claim 2 is respectfully requested.

### **III. 35 U.S.C. §102(b)(e)**

A. It is asserted in the Office Action that claims 1-3 are rejected under 35 U.S.C. §102(b) as being anticipated by U. S. Patent No. 5,670,431 issued to Huang et al. ("Huang"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2131, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' (Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). 'The identical invention must be shown in as

complete detail as is contained in the ... claim.’ (Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. (In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)).”

Applicant’s amended claim 1 contains the limitations of “[a] method for fabricating a capacitor of a semiconductor device, comprising the steps of: (a) forming a conductive silicon layer for a bottom electrode on a substrate; (b) forming a first silicon oxide layer on the conductive silicon layer; (c) forming a first silicon nitride layer on the first silicon oxide layer; (d) forming a second silicon oxide layer on the first silicon nitride layer; (e) forming a second silicon nitride layer on the second silicon oxide layer; (f) forming a dielectric layer on the second silicon nitride layer; and (g) forming a top electrode on the dielectric layer.”

In other words, Applicant’s claimed invention provides a method for fabricating a capacitor including a first silicon oxide layer 26. Also, for densifying the first silicon oxide layer 26, a thermal treatment process is carried out. This process can minimize oxidization of the bottom electrode 25 during a thermal treatment process after a dielectric layer deposition process, i.e., step (f) of claim 1. (See Applicant’s specification, page 6, line 32 to page 7, line 11; Figure 2B).

Huanga discloses a method of forming a ultra-thin silicon nitride/silicon oxide dielectric layer over a polysilicon capacitor electrode formed adjacent to a silicon oxide insulating layer. Huang, however, does not teach, disclose or suggest the first silicon oxide layer 26 of Applicant’s claimed invention. Therefore, Huang does not teach, disclose or suggest “forming a conductive silicon layer for a bottom electrode on a substrate; (b) forming a first silicon oxide layer on the conductive silicon layer; (c) forming a first silicon nitride layer on the first silicon oxide layer; (d) forming a second silicon oxide layer on the first silicon nitride layer; (e) forming a second silicon nitride layer on the second silicon oxide layer; (f) forming a dielectric layer on the second silicon nitride layer; and (g) forming a top electrode on the dielectric layer.”

Since Huang does not disclose, teach or suggest all of Applicant's amended claim 1 limitations, Applicant respectfully asserts that a *prima facie* rejection under 35 U.S.C. § 102(b) has not been adequately set forth relative to Huang. Thus, Applicant's amended claim 1 is not anticipated by Huang. Additionally, the claims that directly or indirectly depend on claim 1, namely claims 2-3, are also not anticipated by Huang for the same reason. Applicant also notes that new claims 8-9 directly depend on amended claim 1, and therefore are also not anticipated by Huang for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 102(b) rejections for claims 1-3 are respectfully requested.

**B.** It is asserted in the Office Action that claims 1-3 and 6-7 are rejected under 35 U.S.C. §102(e) as being anticipated by U. S. Patent App. 2003/0042526 issued to Weimer ("Weimer"). Applicant respectfully disagrees.

Weimer discloses methods for forming dielectric layers over polysilicon substrates used for construction of capacitors. Weimer, however, does not teach, disclose or suggest the first silicon oxide layer 26 of Applicant's claimed invention. Therefore, Weimer does not teach, disclose or suggest "forming a conductive silicon layer for a bottom electrode on a substrate; (b) forming a first silicon oxide layer on the conductive silicon layer; (c) forming a first silicon nitride layer on the first silicon oxide layer; (d) forming a second silicon oxide layer on the first silicon nitride layer; (e) forming a second silicon nitride layer on the second silicon oxide layer; (f) forming a dielectric layer on the second silicon nitride layer; and (g) forming a top electrode on the dielectric layer."

Since Weimer does not disclose, teach or suggest all of Applicant's amended claim 1 limitations, Applicant respectfully asserts that a *prima facie* rejection under 35 U.S.C. § 102(b) has not been adequately set forth relative to Weimer. Thus, Applicant's amended claim 1 is not anticipated by Weimer. Additionally, the claims that directly or indirectly depend on claim 1, namely claims 2-3 and 6-7, are also not anticipated by Weimer for the same reason. Applicant also notes that new claims 8-9 directly depend

on amended claim 1, and therefore are also not anticipated by Weimer for the same reason.

Accordingly, withdrawal of the 35 U.S.C. §102 (b) and (e) rejection for claims 1-3 and 6-7 is respectfully requested.

#### IV. 35 U.S.C. §103(a)

A. It is asserted in the Office Action that claims 4-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 5,670,431 issued to Huang ("Huang"). Applicant respectfully disagrees.

According to MPEP §2142 "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (*In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP §2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974))." "*All words in a claim must be considered* in judging the patentability of that claim against the prior art." (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant's claims 4-5 indirectly depend on amended claim 1. Applicant has addressed claim 1 regarding Huang above in section III (A). Huang does not teach, disclose or suggest Applicant's claim 1 limitations of "forming a conductive silicon layer for a bottom electrode on a substrate; (b) forming a first silicon oxide layer on the conductive silicon layer; (c) forming a first silicon nitride layer on the first silicon oxide layer; (d) forming a second silicon oxide layer on the first silicon nitride layer; (e)

forming a second silicon nitride layer on the second silicon oxide layer; (f) forming a dielectric layer on the second silicon nitride layer; and (g) forming a top electrode on the dielectric layer.”

Since Huang does not teach, disclose or suggest all the limitations of Applicant's amended claim 1, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's amended claim 1 is not obvious over Huang in view of no other prior art since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claim 1, namely claim 4-5, would also not be obvious over Huang in view of no other prior art for the same reason.

Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection for claims 4-5 is respectfully requested.

**V. Double Patenting**

It is asserted in the Office Action that claims 1-5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7, 13 and 14 of copending Application No. 10/318,100 of Oh et al. in view of Huang. It is also asserted that claims 6-7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7, 13 and 14 of Oh in view of Weimer.

Similarly as in Huang and Weimer, Applicant asserts that Oh does not teach, disclose or suggest the first silicon oxide layer 26 (see Oh, Figures 4 and 7A). Applicant, however, submits a timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) to overcome the provisional obviousness-type double patenting rejections.

Accordingly, withdrawal of the provisional obviousness-type double patenting rejections for claims 1-5 and 6-7 are respectfully requested.

**CONCLUSION**

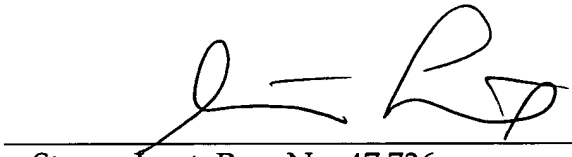
In view of the foregoing, it is believed that all claims now pending, namely 1-9 patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

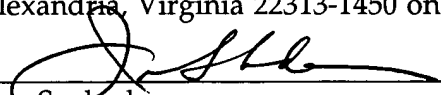
Dated: August 4, 2004

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